

8.2 Antenna systems

Different antenna systems can be used with the WIMAN radio modem:

Part.-No.	750081	750083	750001	750040	750061	750062
Matchcode	AN-24-2MN360-FMEM	AN-24-8MN360-NF3	AN-24-8PL76-SMAF	AN-24-16PL24-NF	AN-24-24PF8-NF	AN-24-16PL85-NF
Type	Omni directional	Omni directional, 3° down-tilt	planar	planar	paraflector	Planar
Gain [dBi]	2	8	8,5	16	24	16.5
Azimuth [degrees]	360	360	75	27	7	85
Elevation [degrees]	> 60	13	60	27	10	6
Height [cm]	12	43	11	28	61	127
Width [cm]	3	3	9	28	92	8
Depth [cm]	3	3	3	4	38	5
Weight [kg]	0.04	0.2	0.1	0.9	2.4	2.1
Front/Back Ratio [dB]	N/a	n/a	20	40	31	25
VSWR (max.)	2	1.5	1.5	1.5	1.3	1.5
Connector	FME male	N female	SMA female	N female	N female	N female

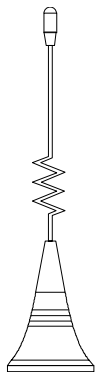
Appendix A: WIMAN Hardware

- **Omni directional antennas**

Typically these antennas are used with WIMAN STAR stations.

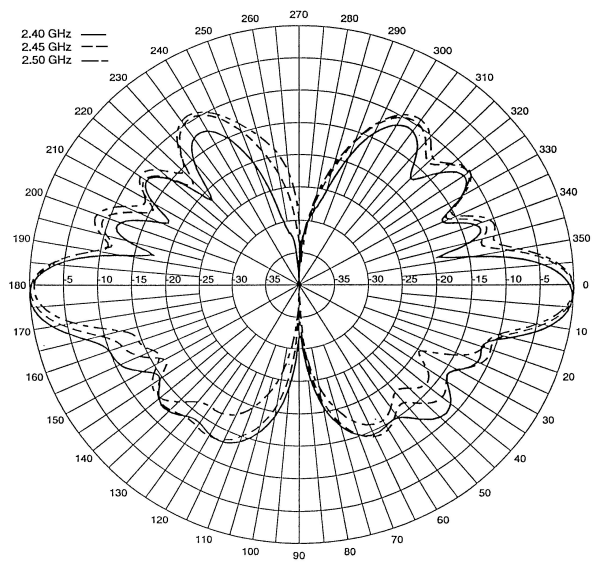
AN-24-2MN360-FMEM

2 dBi



AN-24-8MN360-NF3

8 dBi, 3 deg downtilt



- **Planar antennas**

These antennas are mainly used at the customer side in connection with the WIMAN ACCESS. They can be used also for point-to-point connections with WIMAN LINE units.

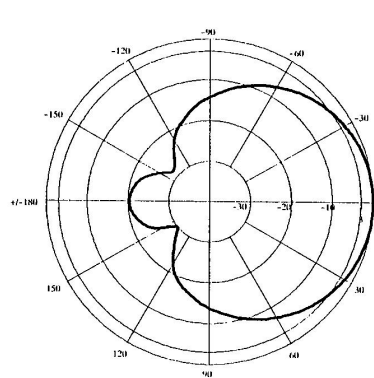
AN-24-8PL76-SMAF

8.5 dBi

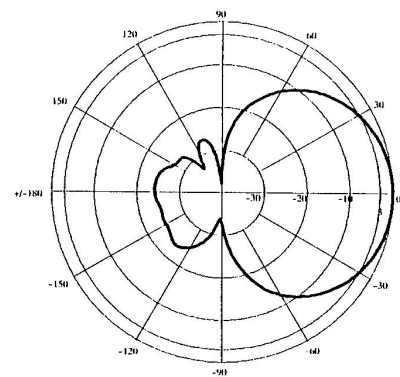
Picture



Azimuth Pattern



Elevation Pattern



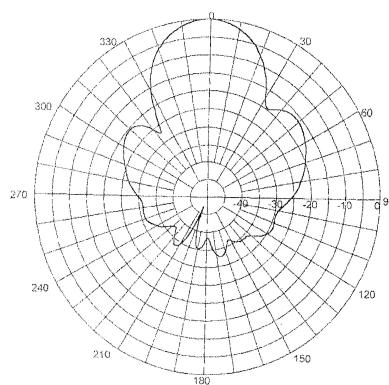
AN-24-16PL24-NF

16 dBi

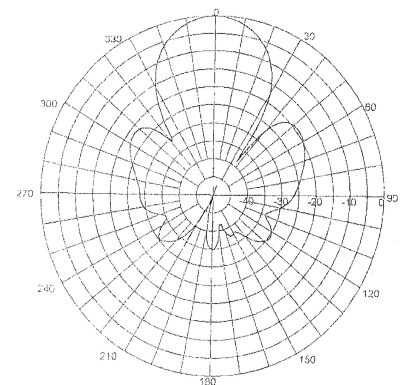
Picture



Azimuth Pattern



Elevation Pattern



Appendix A: WIMAN Hardware

- **Paraflector antennas**

These antennas were developed mainly for point-to-point connections over long distances.

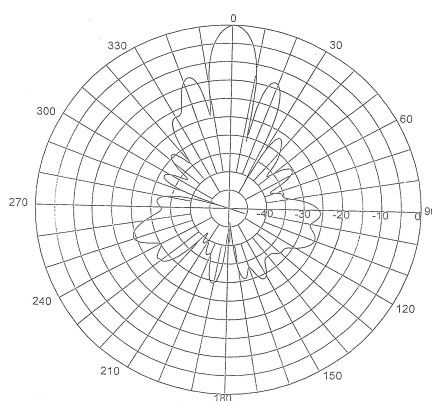
AN-24-24PF8-NF

24 dBi

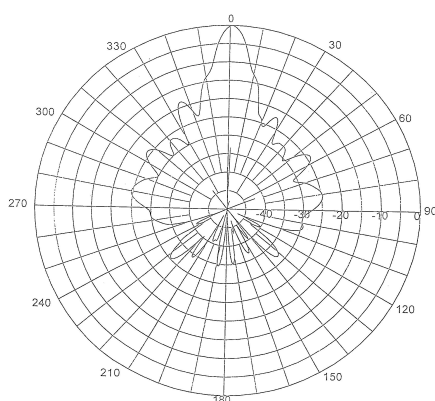
Picture



Azimuth Pattern



Elevation Pattern



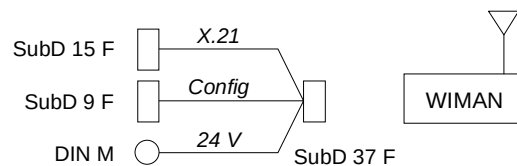
8.3 Hybrid-cable sets

Nachfolgend sind einige Anschlussbeispiele für die verschiedenen Hybridkabel aufgeführt. Eine genaue Beschreibung der einzelnen Hybridkabel ist in Kapitel 8.4 auf Seite 78 nachzulesen.

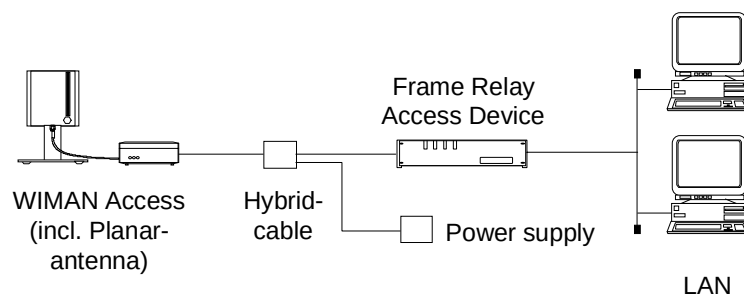
8.3.1 Standard Connection (Indoor) using Hybrid cable Type 1

Hybrid-cable Type 1 is only used when a WIMAN is directly connected to a Router (e.g. CISCO). This type of connection can be used for devices, which are in close range to the Router (Indoor-Installation).

(H1-X21C-37)

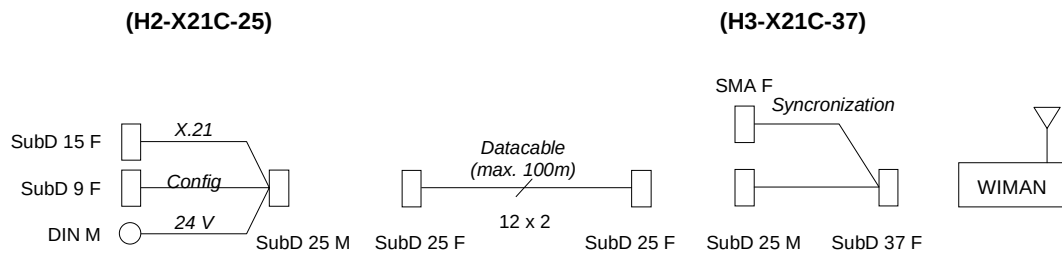


Sample:

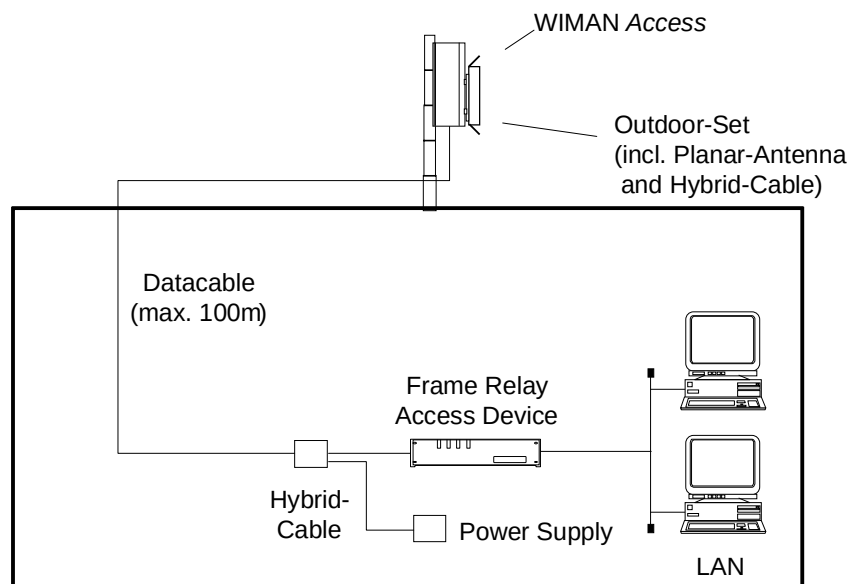


8.3.2 Outdoor Installation using Hybrid cable Type 2 & 3 and Datacable

This connection is used when the WIMAN is installed on a roof-top or a radio tower and is synchronized among other WIMAN devices. In addition a data cable (12x2) is needed.

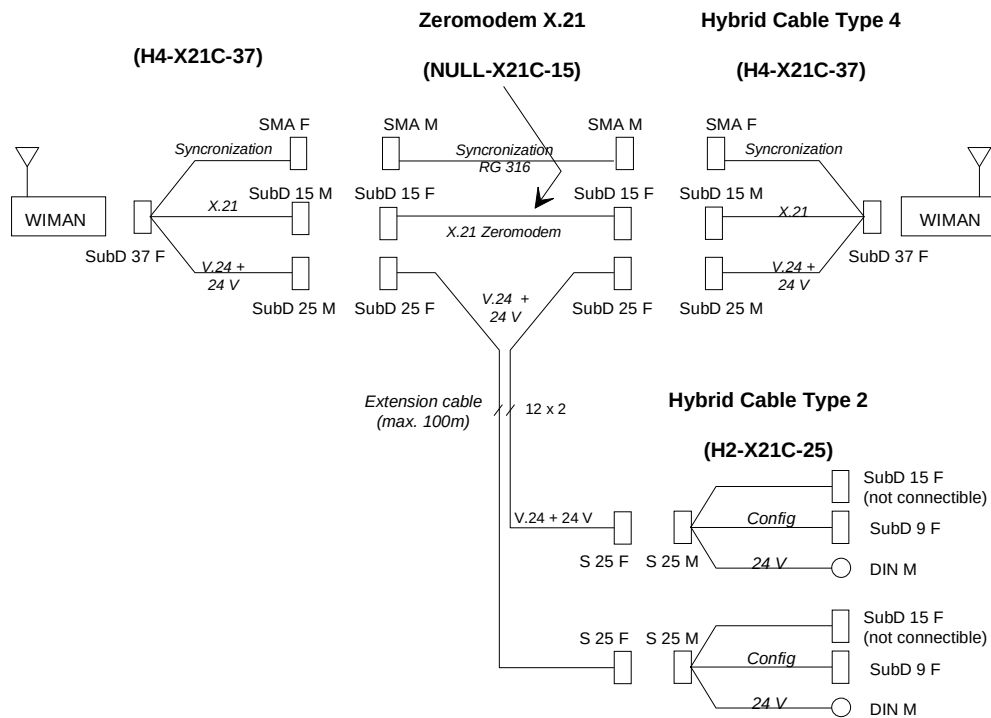


Sample:



8.3.3 Connection of a remote POP with WIMAN LINE and STAR

This link is used for a remote Point Of Presence, if a WIMAN STAR is connected via a WIMAN LINE link. Here the STAR receives the synchronisation impulses likewise via the LINE link.



8.3.4 Connections when using the IP-routing functionality

Still being revised

8.4 Hybridcable

In the following, all hybrid cables with their appropriate area of application are described.



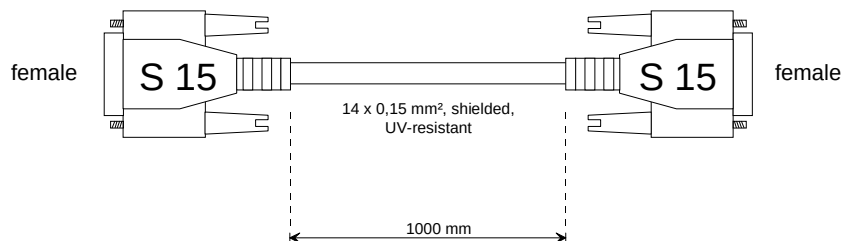
Note:

The 37-pin SubD link (female) is always attached to the 37-pin SubD link (male) of the WIMAN.

8.4.1 Hybridcable used for X21-configurations

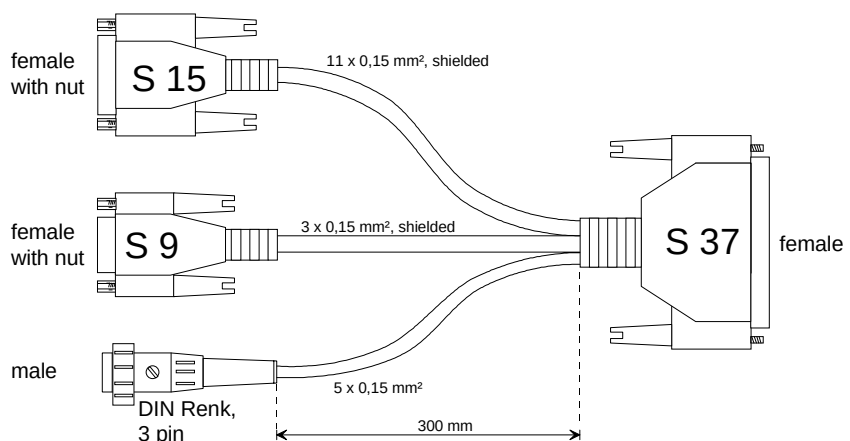
Zeromodemcable (NULL-C21-15)

Zeromodemcable for direct connection of 2 WIMAN devices. In addition a Hybrid cable Type H4 is needed.



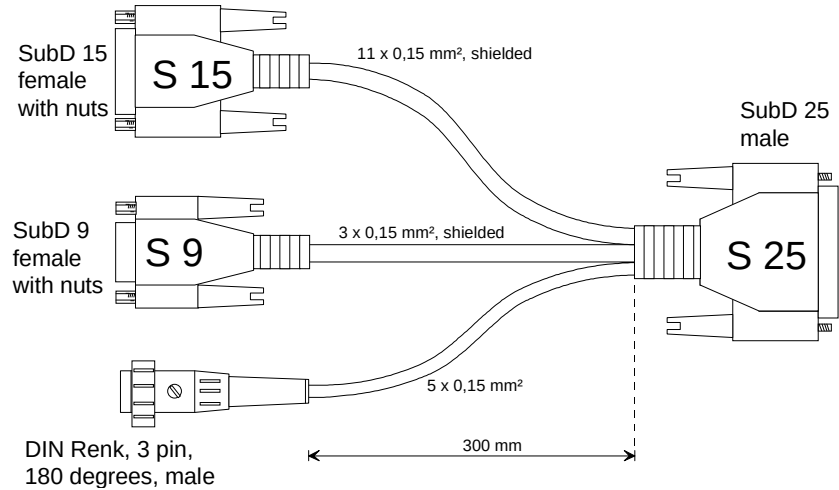
Hybridcable Type1 (H1-X21C-37)

This hybrid cable is used with indoor installations and provides the power connection, a direct link for a Frame Relay capable Router as well as a configuration interface (RS-232).



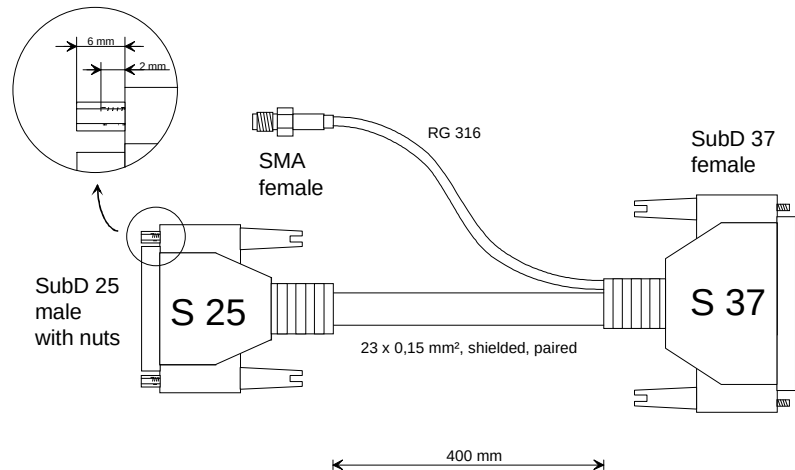
Hybridcable Type 2 (H2-X21C-25)

This Hybrid cable is being used as an internal termination cable when installing a WIMAN on a radio-tower on on a rooftop. The 25pin SubD-plug (male) is connected to the 12x2 Data-cable, which leads from the WIMAN to the Router. All other connectors are the same as on Hybrid cable type 1.



Hybrid cable Type 3 (H3-X21C-37)

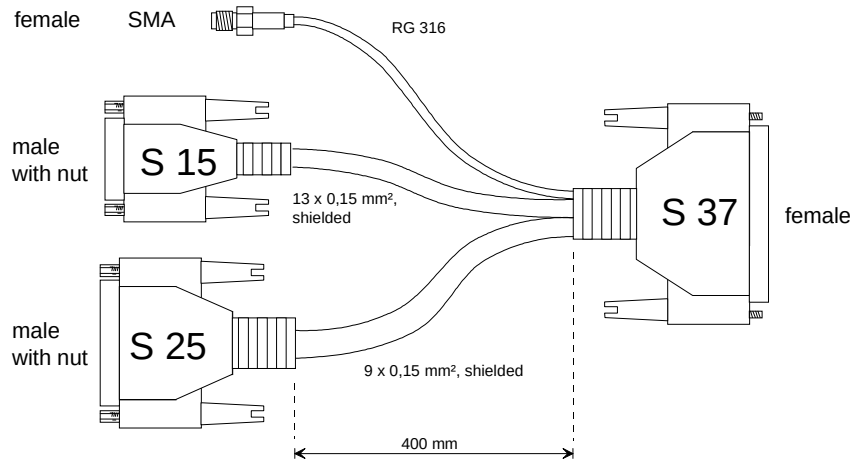
This hybrid cable is attached with outdoor installations between the WIMAN and the data cable (12x2). The SMA socket serves for the link to the synchronisation bus, if several WIMAN devices are mounted in direct proximity.



Date: 27. June 2000

Hybrid cable Type 4 (H4-X21C-37)

This hybrid cable is used with a Peer to Peer structure of a remote POP. For this an additional NULL-X21C-15 cable, a synchronisation bus, a data cable (12x2) and a hybrid cable Typ2 becomes necessary (schematic structure see further above.)

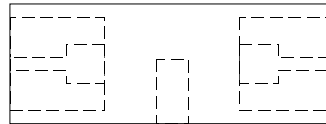


8.4.2 Hybrid cable when using the IP-routing-functionality

RJ45-Connectionbox (HA-ETH-45)

This link box is attached between the Ethernet cable of the local network and the hybrid cable H3-eth-37ext. Into the box the current supply link of the WIMAN, which is connected to the power pack, is integrated.

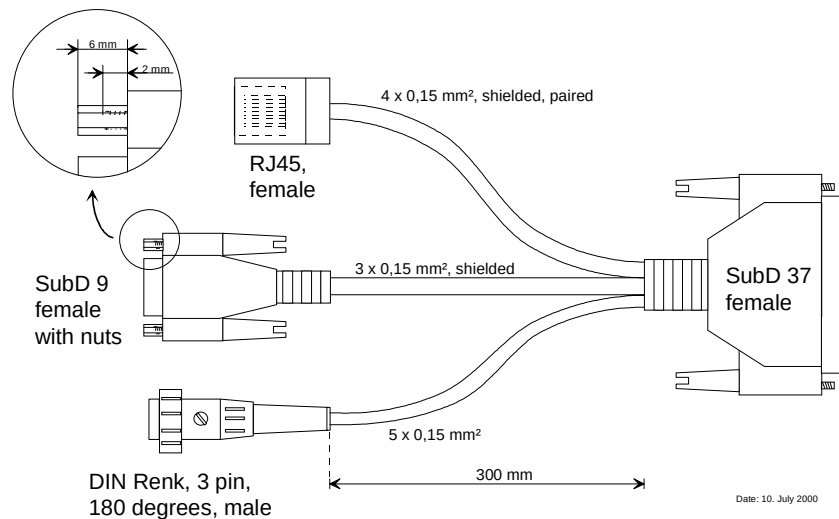
RJ 45
female



RJ 45
female

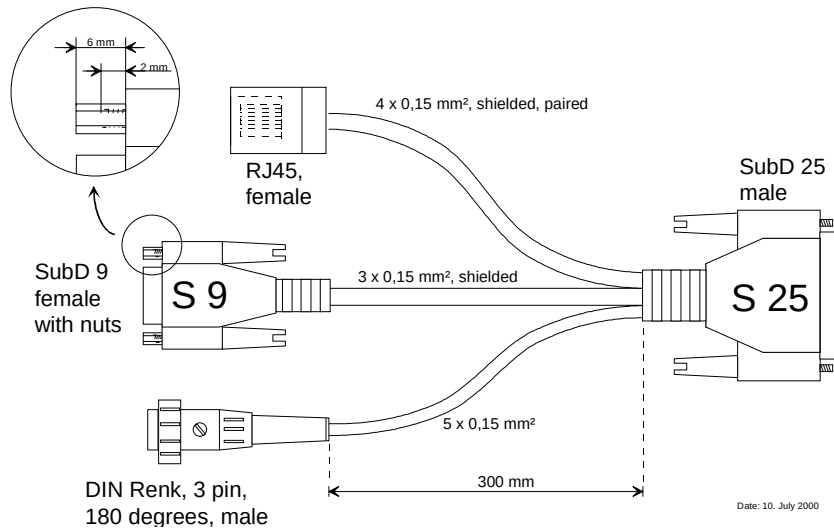
Hybrid cable Ethernet 1 (H1-ETH-37)

This Ethernet hybrid cable is used for indoor installations and provides the power connection, a direct link to the local network (over Ethernet cable) and a configuration interface (RS-232).



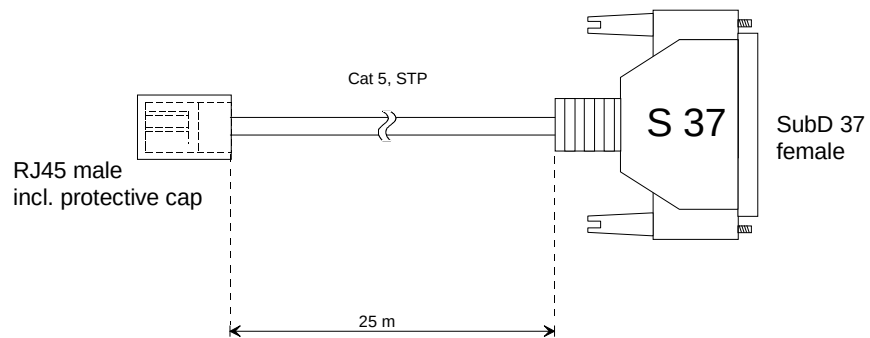
Hybrid cable Ethernet 2 (H2-ETH-25)

This hybrid cable is used as internal terminal cable with radio tower installations or installation of the WIMAN on a rooftop. The 25-pin SubD (male) link is connected to the data cable (12x2), which leads from the WIMAN (outdoor) to the inward. The further interfaces correspond to those of the hybrid cable Type Ethernet 1.



Hybrid cable Ethernet 3 (H3-ETH-37EXT)

This hybrid cable serves for the link of the WIMAN to the local Ethernet. The current supply lines of the WIMAN are already integrated in this cable. This cable can be used only together with the link port HA-ETH-45.



9

Appendix B: Technical data**Product outline**

WIMAN Star, Access	high-speed transfer in point-to-multi-point mode
WIMAN Line	flexible point-to-point transfer

Radio

Frequency range	2.400 - 2.4835 GHz
Type of modulation	Spread Spectrum Frequency Hopping 2-FSK, 4-FSK
Number of channels	80, non-overlapping
Wireless interface	1 Mbps, 2-FSK 2 Mbps, 4-FSK
Transmitting power	100 mW (ETSI-Version) (E.I.R.P.) 4 W (FCC-Version) (E.I.R.P.) (650 mW max output-power @ RF-connector)
Transfer capacity	256 KBps @ 2-FSK 512 KBps @ 4-FSK
Max. input-level	0 dBm
Recipient-sensitivity	-94 dBm @ 2-FSK -88 dBm @ 4-FSK
Range	up to 5 km (ETSI-Version with planar array antennas) up to 25 mi (FCC-Version)
RF-connector	SMA plug connector

RF interface

Configurable block-repetition
 CRC-based error correction
 In-slot acknowledgement
 Device-specific data encryption

Data-interface

Synchronous	X.21 / V.35 (optional) max. 2 Mbps
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Appendix B: Technical data

Protocols

Point-to-point-mode

Synchronous	Transparent (HDLC-frame structure)
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Point-to-Multipoint-mode

Synchronous operation	Frame Relay Packet Switching
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Antennas

Mobile antenna	Omnidirectional 2 dBi
Fixed antennas	Omnidirectional 8 dBi Planar 8.5 dBi Planar 16 dBi Paraflector 24 dBi

Mass & weights (without antennas)

WIMAN-device	176 x 110 x 40 mm, 1050 g
Outdoor box	300 x 190 x 85 mm, 2200 g

General

Voltage supply	12 – 26 V =; max. 10 W 110 – 230 V, 50 -60 Hz~
Temperature range	-20°C - +55°C
Humidity	100 %, not condensing
IP enclosure	IP63, mounted in security housing
Display	3 LEDs, two-colored

Administration

Remote looptest

SNMP-based status-query and error signaling

Network access via TCP / IP, password protected

Software-update via TFTP

Individual bandwidth management

10 Appendix C: Pin-allocation of the Data-cables

10.1 WIMAN Datacable (10 x 2)

Pin	Wire color (1. line)	Pin	Wire color (2. line)
1	White/Grey	14	White/Green
2	-	15	Brown/Green
3	White/Yellow	16	Pink/Brown
4	Yellow/Brown	17	White/Pink
5	White	18	Grey/Pink
6	Brown	19	Red/Blue
7	-	20	-
8	Grey/Brown	21	Black
9	Green	22	Purple
10	Yellow	23	-
11	Pink	24	Red
12	Grey	25	Blue
13			

Table 7 WIMAN data cable (10 x 2), pin assortment



Attention:

Provide a correct grounding of the data cable screen.

Paired-wire	Wire color	Pin number	Wire color	Pin number
1	White	5	Brown	6
2	Green	9	Yellow	10
3	Grey	12	Pink	11
4	Blue	25	Red	24
5	Black	21	Purple	22
6	Grey/Pink	18	Red/Blue	19
7	White/Green	14	Brown/Green	15
8	White/Yellow	3	Yellow/Brown	4
9	White/Grey	1	Grey/Brown	8
10	White/Pink	17	Pink/Brown	16
Shield		Shield		

Table 8 WIMAN data cable (10 x 2) paired-wire assortment

10.2 WIMAN Datacable (12 x 2)

Pin	Wire color (1. line)	Pin	Wire color (2. line)
1	White/Grey	14	White/Green
2	Grey/Brown	15	Brown/Green
3	White/Yellow	16	Pink/Brown
4	Yellow/Brown	17	White/Pink
5	White	18	Grey/Pink
6	Brown	19	Red/Blue
7	White/Blue	20	White/Red
8	Brown/Blue	21	Black
9	Green	22	Purple
10	Yellow	23	Brown/Red
11	Pink	24	Red
12	Grey	25	Blue
13			

Table 9 WIMAN data cable (12 x 2) pin assortment



Attention:

Provide a correct grounding of the data cable screen.

Paired-wire	Wire color	Pin number	Wire color	Pin number
1	White	5	Brown	6
2	Green	9	Yellow	10
3	Grey	12	Pink	11
4	Blue	25	Red	24
5	Black	21	Purple	22
6	Grey/Pink	18	Red/Blue	19
7	White/Green	14	Brown/Green	15
8	White/Yellow	3	Yellow/Brown	4
9	White/Grey	1	Grey/Brown	8
10	White/Pink	17	Pink/Brown	16
11	White/Blue		Brown/Blue	
12	White/Red		Brown/Red	
Screen		Screen		

Table 10 WIMAN data cable (12 x 2) Paired-wire assortment

Fehler! Verweisquelle konnte nicht gefunden werden.

Appendix D: Alphabetical list of instructions

11 Appendix D: Alphabetical list of instructions

Instruction	Applicable in command mode starting from authorization level	Applicable in configuration mode starting from authorization level	Remarks
<pname> <value>	-	1	
Checkcfg	-	1	
Clear	1	1	
Clear stat <type>	1	-	
Config	1	-	
Del config	-	1	
Del <pname>	-	1	
Del passwd console	-	1	
Enable	1	-	No help available
Exit	1	-	No help available
Export	1	1	
Help	1	-	
Help <pname>	1	1	
Passwd console	-	1	
Passwd console crypt	-	1	No help available
Passwd enable	-	1	
Passwd enable crypt	-	2	No help available
Reset	1	-	
Reset config	-	1 (configuration password)	No help available
Restore	-	1	
Save	1	-	
Show	1	1	
Show <regex>	1	1	
Stat <type>	1	1	
Swupdate	1		

Table 11 alphabetical list of instructions

12 Index

Will be created later

13 Index of figures

Figure 1	Point-to-Point connection using WIMAN LINE.....	10
Figure 2	wireless access networks with WIMAN STAR and WIMAN ACCESS	11
Figure 3	Standard Frame Relay applications.....	12
Figure 4	Diagram of the different operating modes	15
Figure 6	exported configuration file	28
Figure 7	Help display output	30
Figure 8	the statistics assistance display.....	31
Figure 9	arrangement of equipment for the configuration of the WIMAN radio modem	34
Figure 10	Frame Relay connections with the WIMAN	58
Figure 11	Simple WIMAN Network with CISCO-Router.....	62
Figure 12	front side of the WIMAN radio modem.....	70
Figure 13	rear side of the WIMAN radio modem	70

14 Index of tables

Table 1	parameters of an extended point-to-point connection (connection 1)	54
Table 2	parameter of an extended point-to-point connection (connection 2)	54
Table 3	Structure of the 2 Byte long address array	59
Table 4	NodeId with 2-Byte-Frame Relay address array	60
Table 5	DLCI allocation in connection with 2-Byte-address array	61
Table 6	bit sequence for different DLCI identifiers	61
Table 7	WIMAN data cable (10 x 2), pin assortment	85
Table 8	WIMAN data cable (10 x 2) paired-wire assort-ment	85
Table 9	WIMAN data cable (12 x 2) pin assortment	86
Table 10	WIMAN data cable (12 x 2) Paired-wire assortment	86
Table 11	alphabetical list of instructions	87